UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/134,272	08/14/1998	ZIFEI PETER WANG	003239.P010	7801

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EXAMINER
ARMSTRONG, ANGELA A.

ART UNIT	PAPER NUMBER
2654	2 4

DATE MAILED: 11/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 August 2003* .

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *4-6,9,11,12,15-17 and 22-37* is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *4-6,9,11,12,15-17 and 22-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

　　If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All b)☐ Some * c)☐ None of:

　　　1.☐ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____ .

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
　　　　　application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

　　a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)　　　　　4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)　　5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .　　6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set
forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior   .
art are such that the subject matter as a whole would have been obvious at the time the invention was made to a
person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived
by the manner in which the invention was made.

2.   Claims **4, 6, 9, 11-12, 15-17, 22-23, and 25-37** are rejected under 35 U.S.C. 103(a) as

being unpatentable over *Polcyn et al.* (US Patent No. 5,311,588) in view of *Modi et a*l.

(US Patent No. 6,125,345) in further view of *Nicholls et al* (US Patent No. 6,223,154).

3.   Regarding claims **4, 6, 9, 11-12, 15-17, 22-23, and 25-37**, *Polcyn et al.* discloses a method

and system for determining the progress of a calling connection be determining signal

transitions from tone to silence, silence to speech, etc. In the Abstract, at col. 1, lines 59-66

continuing to col. 2, lines 1-33, col. 7, lines 49-67 continuing to col. 8, lines 1-25, col. 16,

lines 20-37, and col. 16, lines 49-62 *Polcyn et al.* suggests/teaches a method of calculating

a first ratio level of said audio signals and an average power level of signals (determining a

peak-to-mean ratio) and comparing...ratio levels to a set of criteria to determine the line

status (comparing the peak-to-mean ratio to a selected threshold to determine whether a

frame represents a voice signal). At col. 2, lines 21-22 *Polcyn et al* teach that an essential

feature of the invention is determining the difference between noise and a voice.

Polcyn et al. does not disclose that the ratios used in the detection method are

normalized. However, refer to *Modi et al* who teach a system, which uses confidence measures

for performing classification and verification. *Modi et al* teach confidence measures of

likelihood scores and likelihood ratios at col. 4, lines 15-16. At col. 9, lines 32-36, *Modi et al*

teach normalizing the confidence scores based on their dynamic ranges. As such, the claimed

normalization calculations using the maximum averaged minus minimum averaged peak-to-

mean ratio for the current audio frame constitutes dynamic range normalization.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention

to modify the system of *Polcyn et al* to normalize the peak-to-average ratios for the purpose of

providing verification of the noise/voice determination as suggested by *Modi et al*.

The combination of Polcyn and Modi does not teach using short-term averaged energy,

long-term averaged energy, etc., in the voice/speech detection process. However, refer to *Nicholls*

et al who discloses a communication device capabilities which implements a voice activity

detector for an audio communication system using PCM data which calculates average energy

values of received frames and determines if the average value exceeds a threshold and compares a

staggered average energy value to a current frame energy value (col. 3, lines 64-66; col. 5, line 45-

col. 6, line 65; col. 7, lines 8-36; col. 7, line 37-col. 8, line 10), for the purpose of deciding when

received audio contains voice or other audio information of importance.

Therefore, to the extent that *Polcyn et al and Modi et al* do not implement short-term

averaged energy, long-term averaged energy... in a voice/speech activity detection system, it

would have been obvious to one of ordinary skill at the time of invention to modify the system of

Polcyn et al and Modi et al to implement the averaged energy determinations and calculations

for the purpose of providing an enhanced voice activity detection system for deciding when

received audio contains voice or other audio information of importance, as taught by *Nicholls et*

4.   Claims **5 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Polcyn*

et al, in view of Modi et al, and *Nicholls* as applied to claims 6 and 22 above, and further

in view of *Janiszewski et al.,* (US Patent No. 5,657,422).

5.   Regarding claims **5 and 24,** "conducting weighted average," it is noted that *neither*

Polcyn et al, Modi et al, nor *Nicholls et al* disclose weighted averages. *Janiszewski*

discloses a voice activity detection system that estimates energy and noise of a signal.

Specifically at col. 6, lines 1-8 *Janiszewski* disclose using a smoothing constant in

calculating signal estimates and setting the smoothing constant to provide for acceptable

frame averaging.

Therefore, to the extent that neither *Polcyn et al, Modi et al,* nor *Nicholls et al* disclose

weighted averaging, it would have been obvious to one of ordinary skill at the time of invention

to modify the voice detection of system of *Polcyn et al, Modi et al,* and *Nicholls et al* to conduct

a weighted average by using a smoothing constant for the purpose of providing acceptable frame

averaging as taught by *Janiszewski et al.*

Response to Arguments

6.   Applicant's arguments filed August 25, 2003 have been fully considered but they are not

persuasive.

Applicant argues Nicholls has no relationship to the utilization of short-term and long-term averaged energy computations. The Examiner disagrees and argues that the staggered averaged energy calculations of Nicholls compensates for the background noise by implementing the voicing value in the staggered average value (col. 6, lines 30-65), which reads on the short-term and long-term averaged energy computations.

Applicant argues that neither Nicholls, Polcyn nor Modi teach or suggest the use of long-term average energies as claimed. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In this instance, Nicholls is cited as teaching a voice activity detector for an audio communication system using PCM data which calculates average energy values of received frames and determines if the average value exceeds a threshold and compares a staggered average energy value to a current frame energy value, for the purpose of deciding when received audio contains voice or other audio information of importance. Polcyn was cited as teaching the calculation of peak-to-average ratios such that determined likelihood ratios are compared to a predetermined threshold to determine signal transitions from tones to silence, silence to speech, etc. Further, Modi was cited as teaching determining confidence measures of likelihood scores and likelihood ratios are determined such that the scores are normalized based on their dynamic ranges (which reads on "the difference between the maximum averaged peak-to-mean ratio and the minimum averaged peak-to-mean ratio).

Therefore, the combination of Nicholls, Polcyn and Modi would provide for a voice

activity detector for an audio communication system using PCM data which calculates average

energy values of received frames and determines if the average value exceeds a threshold and

compares a staggered average energy value to a current frame energy value (as provided by

Nicholls), and further providing for the calculation of peak-to-average ratios (as provided by

Polcyn), wherein confidence measures of likelihood scores and likelihood ratios are determined

such that the scores are normalized based on their dynamic ranges (which reads on "the

difference between the maximum averaged peak-to-mean ratio and the minimum averaged peak-

to-mean ratio), as suggested by Modi, and the determined likelihood ratios are compared to a

predetermined threshold to determine signal transitions from tones to silence, silence to speech,

etc. (as suggested by Polcyn).

In response to applicant's argument that there is no suggestion to combine the references,

the examiner recognizes that obviousness can only be established by combining or modifying the

teachings of the prior art to produce the claimed invention where there is some teaching,

suggestion, or motivation to do so found either in the references themselves or in the knowledge

generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5

USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In this case, *Nicholls et al* specifically discloses a system that calculates average energy values

of received frames and determines if the average value exceeds a threshold and compares a

staggered average energy value to a current frame energy value (col. 3, lines 64-66; col. 5, line

45-col. 6, line 65; col. 7, lines 8-36; col. 7, line 37-col. 8, line 10), for the purpose of deciding

when received audio contains voice or other audio information of importance (col. 3, lines 16-18).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

7.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Angela A. Armstrong whose telephone number is 703-308-6258.

The examiner can normally be reached on Monday-Thursday 7:30-5:00 PM.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Richemond Dorvil can be reached on (703) 305-9645. The fax phone number for

the organization where this application or proceeding is assigned is (703) 872-9306.

        Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is 703-306-0377.

<div style="text-align: right">

Angela A. Armstrong
Examiner
Art Unit 2654
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AAA
November 15, 2003

RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER